

STUDIES ON CALIFORNIA ANTS. 6. THREE NEW SPECIES
OF *MYRMECOCYSTUS* (Hymenoptera: Formicidae)

By ROY R. SNELLING¹

ABSTRACT: Three new species of honey ants are herein described from southern California: *M. ewarti* from Shaver's Well, Riverside Co. (*mexicanus* group); *M. creightoni* from Pear-blossom, Los Angeles Co. (*lugubris* group); *M. wheeleri* from Los Angeles Co. (*wheeleri* group). All castes of the three species are described and illustrated.

The following three new species are described in advance of my forthcoming revision of *Myrmecocystus* to provide names for a study to be published by G. C. Wheeler. Detailed distribution data, other than citation of type material are not given. These data will be presented in the revision.

In the interests of conserving space in the description, some features of the head and thorax are indicated by code letters: CI, Cephalic Index—(HW/HL) (100); EL, Eye Length—With the head in full face view, the maximum length of the compound eye; HL, Head Length—With the head in full face view, the anterior clypeal margin and occipital margin on the same plane, the maximum distance between these points along the midline; HW, Head Width—With the head in full face view, the greatest measurable distance between head margins below the eyes (worker and female) or at the level of the upper eye margin (males); IOD, Interocellar Distance—With head in full face view, the maximum distance between the inner margins of the posterior (or lateral) ocelli (Sexual castes only); OD, Ocellar Diameter—The transverse diameter of the anterior (or middle) ocellus, with the head in full face view (Sexual castes only); OMD, Oculo-Mandibular Distance—With the head in full face view, the distance between the lower margin of the eyes and mandibular bases; OOD, Ocellar-Ocular Distance—With the head in full face view, the minimum *horizontal* distance between the posterior ocelli and the inner eye margin (Sexual castes only); PW, Pronotal Width—In dorsal aspect, the greatest width of the pronotum (workers) immediately anterior to the wing bases (sexual castes); SI, Scape Index—(HW/SL) (100); SL, Scape Length—Maximum measurable scape length, excluding basal condyle; WL, Weber's Length—Diagonal length in lateral aspect of thorax, from anterior pronotal margin to posterior margin of propodeum (= epinotum).

Measurements are in millimeters (mm). Each description begins with a series of measurements, indicating the range in the material studied. Each range is followed by a number in parentheses, indicating the measurement for the holotype, thus: HL 0.93-1.23 (1.20) reads [HL = 0.93-1.23 mm (holotype, 1.20 mm)]. The term "propodeum" is used for the posterior portion

¹Entomology Section, Los Angeles County Museum of Natural History, Los Angeles, Calif. 90007.

of the alitrunk in preference to "epinotum," more widely used by myrmecologists. The usage here is harmonious with that of other studies on hymenopterous insects (Wilson, 1955; Cole, 1968).

Holotypes of the three species described below are in the collection of the Los Angeles County Museum of Natural History. Paratypes will be distributed to the American Museum of Natural History (AMNH), Museum of Comparative Zoology (MCZ), Museum of Natural History, Geneva (MNHG), United States National Museum of Natural History (USNM) and the private collections of Professors A. C. Cole, Jr., W. S. Creighton, and G. C. Wheeler.

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Myrmecocystus ewarti, new species

Figure 1

Diagnosis.—A member of the *mexicanus* group closely related to *M. pyramicus* M. Smith: propodeum produced upward at junction of anterior and posterior faces; petiolar scale strongly compressed in profile; pronotum with two or more fully erect white hairs; disc of first gastric tergite with scattered erect white hairs; hind tibiae with few or no erect hairs.

WORKER. Measurement.—HL 0.76-1.30 (1.23); HW 0.70-1.30 (1.23); SL 0.93-1.36 (1.36); WL 1.10-1.80 (1.70); PW 0.46-0.83 (0.83).

Head shape varying from longer than broad in most workers to slightly broader than long in largest workers, CI 88-104 (100), a little shorter than scape; SI 102-136 (110). In frontal view head broadest at lower margin of eyes, sides slightly convex to straight, narrowed toward mandibular insertions. Occiput, in frontal view, somewhat flattened in middle, sides convex, not at all angulate. Eye large, 1.5 x length of first flagellar segment, EL 0.90-1.15 (0.93) x OMD. Mandible with seven distinct teeth, often with a small intercalary denticle between the penultimate and basal teeth.

Thorax slender to moderately robust, PW 0.37-0.50 (0.48) x WL. Basal face of propodeum pyramidally produced upward at juncture with posterior face, about half as long as posterior face.

Petiole compressed when viewed in profile, crest thin, weakly angularly excised in middle; in dorsal view twice as wide as long.

Vestiture.—Erect hairs sparse on head, confined to clypeus, frontal lobes and occipital areas. Erect pronotal pilosity sparse, but with at least a pair of fine, fully erect hairs which are about as long as apical width of scape; mesonotum with 3-6 erect hairs; propodeum without erect hairs at summit of declivity, or with one or two which are less than half as long as those of mesonotum. Petiolar scale with a few very short, inconspicuous erect hairs on crest. Disc of first tergite with scattered, short, fully erect blunt hairs; second and succeeding tergites with progressively longer discal hairs. Tibiae with very sparse, fine, decumbent to subdecumbent hairs on outer surfaces,

these shorter and finer than the row of gradated bristles on the inner surface. Appressed pubescence very fine, sparse on head, a little more abundant on occiput, especially behind eyes; thoracic pubescence denser than cephalic, but not obscuring surface, denser on sides of propodeum than elsewhere. First three gastric tergites with dense, fine pubescence which does not obscure surface, fourth and fifth with very sparse pubescence.

Integument.—Dull, everywhere very finely coriaceous, with conspicuous round sparse punctures on clypeus; cheeks more densely coriaceous, with scattered elongate punctures; frontal lobes with scattered micropunctures.

Color.—Light brownish yellow, legs and gaster more yellowish; mandibular margins somewhat ferruginous.

FEMALE. Measurements: HL 1.47; HW 1.63; SL 1.42; EL 0.57; OMD 0.52; WL 3.6; PW 1.89.

Head broader than long, CI = 90, longer than scape; SI = 87. In frontal view head broadest behind eyes, sides converging slightly toward mandibular insertions. Occiput, in frontal view flat, with well-rounded corners. Eye large, 1.8 x length of first flagellar segment; removed from mandibular insertion by a little less than its length (11:10). Lateral ocelli separated by three times diameter of anterior ocellus.

Thorax robust, PW 0.52 x WL. In profile posterior two-thirds of mesoscutum and anterior half of scutellum on same plane; metanotum not protruding.

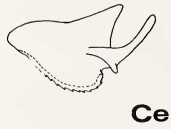
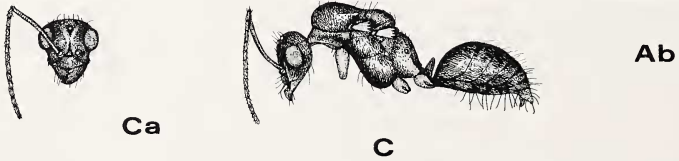
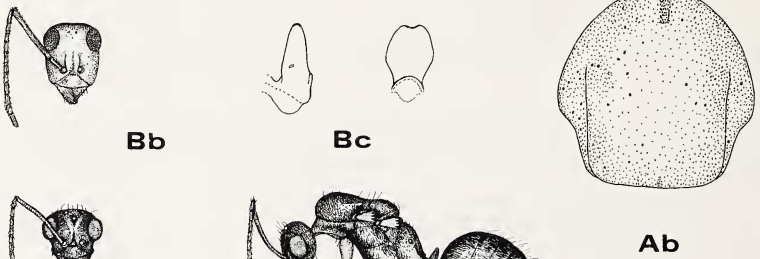
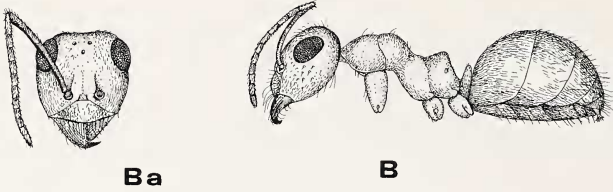
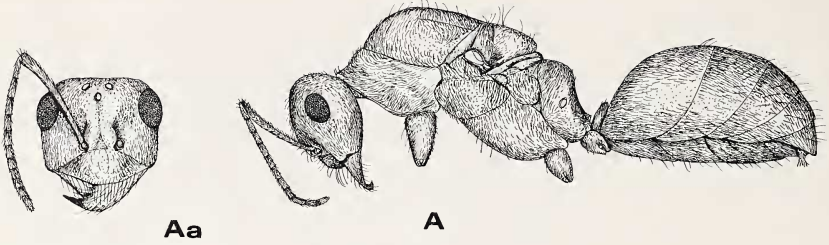
Petiole, in profile, compressed, crest sharp; distinctly notched; from above, about three times wider than long (not clearly visible in only available specimen).

Vestiture.—Erect cephalic pilosity as described for worker; pronotum with a few erect hairs, along anterior margin; mesoscutum and scutellum with scattered long erect yellowish hairs arising from coarse punctures; pleurae with about a dozen long, erect yellowish hairs; propodeum without conspicuous erect hairs; first tergite with scattered subdecumbent to erect yellowish hairs on disc; second and following tergites with fully erect yellowish hairs longer, a little more abundant; inner face of fore femora without conspicuous fully erect hairs, though 15 + are present on ventral surface; middle and hind tibiae with numerous decumbent, fine yellowish hairs.

Pubescence long, yellowish, appressed to decumbent on head, thorax and appendages; fully appressed and abundant on first three tergites, conspicuously sparser on fourth.

MALE.—Measurements: HL 0.66-0.76; HW 0.63; SL 0.73-0.76; EL 0.33; OMD 0.16; WL 1.33-1.43; PW 0.83-1.00.

Margins of head slightly convergent toward mandibular insertions; head a little longer than broad (CI 90-95), a little shorter than scape; SI 115-121; OMD 0.50 x EL; anterior ocellus little smaller than lateral ocelli; IOD 3.0-3.5 x OD; OOD 1.0-1.5 x OD. Mandible with preapical tooth or preapical notch



before apical tooth. Clypeus with or without obscure preapical transverse depression.

Petiole, in profile, distinctly higher than long, sharply cuneate; in frontal view, sides convergent toward narrow, flat, medially notched crest; in dorsal view, about twice as wide as long.

Terminalia: Fig. 1Cc-e.

Vestiture.—Erect hairs yellowish, sparse on head and thorax, longest on scutellum, where they are about equal to *minimum* diameter of eye; propodeum without conspicuous erect hairs; tibiae and scapes without erect hairs. First two tergites with sparse, short erect hairs, third and following segments with conspicuous long, scattered hairs. Pubescence sparse and inconspicuous on head and thorax, conspicuously denser on propodeum above and on first two tergites, forewings with conspicuous fringe hairs from stigma to apex, around apical margin to vein Cu-A; apical and hind margins of hind wing fringed.

Integument.—Moderately shiny, with piligerous micropunctures, a few scattered coarse punctures on scutum and mesopleura.

Color.—Uniformly brownish, appendages yellowish to yellowish brown. Wings whitish hyaline, stigma and veins pale yellowish.

Type material.—Holotype worker, allotype male, 1♀, 16♂♂, 223♀♀ paratypes, Shaver's Well, 3 mi W, Riverside Co., California, 1 March 1964 (R. R. Snelling). Holotype, allotype and most paratypes in LACM; nine paratypes in each of the following: AMNH, MCZ, MNHG, USNM and private collections of A. C. Cole, Jr., W. S. Creighton, and G. C. Wheeler.

Etymology.—This species is named for Dr. William Ewart of the University of California, Riverside, evidently the first person to collect this species. Dr. Ewart's series was sent to me by Professor Creighton who had recognized the species as new and suggested the name.

Present data indicate that this species replaces the similar *M. pyramicus* in southern California on the Mojave and Colorado Deserts. It is probably to be found also in adjacent portions of Arizona, Sonora, and Baja California.

Discussion.—The workers of *M. ewarti* may be separated from those of *M. pyramicus* by the presence of a number of erect hairs on the pronotum and first tergite. A pair of pronotal hairs, which seems always to be present in *M. ewarti*, is as long as or longer than the apical breadth of the scape. Although occasional specimens of *M. pyramicus* may have one or two erect pronotal hairs, they are always much shorter. Erect hairs are present on the hind tibiae of *M. pyramicus* but absent in *M. ewarti*. The median area of the clypeus of

FIGURE 1. *Myrmecocystus ewarti*, new species. A, female, lateral view; Aa, female head, frontal view; Ab, female mesoscutum. B, worker major, lateral view; Ba, worker major, head, frontal view; Bb, worker minor, head, frontal view; Bc, worker petiole, profile and posterior views. C, male, lateral view; Ca, male head, frontal view; Cb, male mandible; Cc, male ninth sternite; Cd, male volsella, inner view; Ce, male aedeagus, lateral view.

M. ewarti has four or more long, erect hairs; in *M. pyramicus* clypeal hairs are confined to the margins.

The single female available of *M. ewarti* is very similar to those of *M. pyramicus* but has a number of erect hairs on the clypeal disc, the antennal scapes possess numerous fine suberect hairs, long erect hairs are abundant on the outer face of the fore femora and there are erect hairs on the hind tibiae. The cheeks of *M. ewarti* are less sharply coriaceous, the punctures below the eyes are larger and are round (clearly elongate in *M. pyramicus*). The best character to separate the females of these species seems to be that of mesocutal punctation. The area between the parapsides in *M. ewarti* is rather uniformly finely, sparsely piligerously punctate. There are, in addition, a number of much coarser, setigerous punctures scattered over the disc. The piligerous punctures, laterad of the parapsides, are little coarser than those of the median area, and are mostly separated by two or more times a puncture diameter. In *M. pyramicus*, the center of the mesoscutum is virtually impunctate, the setigerous punctures are fewer and less conspicuous, and the punctures laterad of the parapsides are much coarser than those of the median area, and are mostly separated by a puncture diameter or less.

The males are very similar and, until more specimens of *M. pyramicus* are available, the differences noted here must be considered provisional. In size, *M. pyramicus* males are conspicuously longer; head length of males of this species exceeds 0.90 mm, while that of *M. ewarti* is less than 0.80 mm. However, *Myrmecocystus* males vary greatly in size within a single colony, so the size difference must be considered with this variability in mind. The lower margins of the fore femora of *M. ewarti* have a number of long, erect hairs as well as many extremely fine, short ones. The few males seen of *M. pyramicus* possess, in addition, about as many long hairs and an equal, or greater, number of hairs about half as long as the longer. The most conspicuous difference is the presence of a discoidal cell in *M. ewarti* males and its lack in those of *M. pyramicus*. Finally, *M. ewarti* males have a well developed fringe of hairs on the apical margin of the fore wing and apical and posterior margins of the hind wing. There is no fringe on the forewing of *M. pyramicus* and on the hind wing it is extremely sparse, most of the hairs separated by much more than their own lengths.

Myrmecocystus creightoni, new species

Figure 2

Diagnosis.—A member of the *lugubris* group identifiable by the presence of abundant reclinate hairs on the antennal scapes and virtual lack of erect hairs on the thoracic dorsum of the workers; female mesoscutum finely, uniformly punctate and with marginal fringes on the wings; male without erect hairs on scapes and tibiae, wings with marginal fringe.

WORKER. Measurements.—HL 0.73-1.03 (0.90); HW 0.60-0.93 (0.80); SL 0.80-1.13 (1.00); WL 0.96-1.50 (1.30); PW 0.40-0.63 (0.56).

Sides of head straight (slightly convex in largest workers), converging slightly toward mandibular insertions, longer than broad in all sizes, CI 78-93 (88), somewhat shorter than scape; SI 108-138 (125). Occiput broadly flattened in frontal view, with poorly indicated lateral corners. Eye small, about as long as first flagellar segment, EL 0.50-0.72 x OMD (0.63). Mandible with seven teeth on cutting margin, rarely with a minute intercalary denticle between basal and penultimate teeth.

Thorax slender to moderately robust, PW 0.36-0.50 x WL (0.41). In larger workers rear of mesonotum dropping sharply to metanotum. Basal face of propodeum as long as posterior face or slightly shorter, juncture of two faces distinctly rounded.

Petiole erect, in profile about twice higher than thick, not at all cuneate, summit rounded; crest flat in frontal view, not, or barely, impressed in middle; in dorsal view about twice as wide as thick.

Vestiture.—Pubescence scattered on cheeks, frons and occiput, nowhere concealing surface, longer than an ocellar diameter; longer and denser on thorax, especially on sides of propodeum, longer and denser on gaster, but usually not concealing surface, sparse at sides of tergites. Hairs of scapes abundant, reclinate (rarely fully erect); occipital hairs shorter than maximum thickness of hind femora; thoracic dorsum usually lacking erect hairs, but three or four inconspicuous ones may be present toward sides; petiolar crest without conspicuous erect hairs; first gastric tergite with discal erect hairs shorter than minimum thickness of hind femora; inner face of fore femora without erect hairs; outer face of middle and hind tibiae with few or no erect hairs.

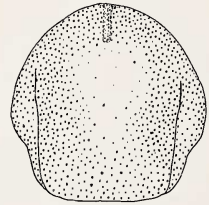
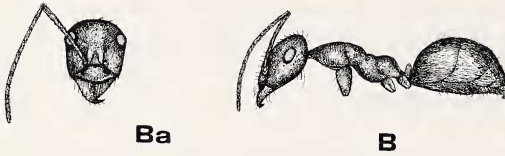
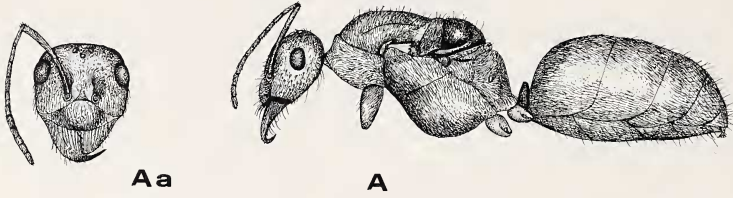
Integument.—Polished on clypeus, cheeks and frons, duller on occiput, with scattered fine piligerous punctures on frons, clypeus and cheeks, those on cheeks often coarse and elongate. Thorax shiny, but no less so than head, densely coriaceous, especially on sides of propodeum; gaster moderately shiny, densely and finely coriaceous.

Color.—Uniformly medium to dark brownish, legs lighter; mandibles and lateral clypeal lobes lighter, often yellowish.

FEMALE. Measurements.—HL 1.40; HW 1.43-1.46; SL 1.33; EL 0.40-0.43; OMD 0.50; WL 2.7-2.9; PW 1.8-1.9.

Head in full face view with margins straight, converging slightly toward mandibular insertions, broad, CI 102-104; a little longer than scape; SI 90-93. Occiput, in frontal view, broad, flat, with rounded lateral angles. Eye small, barely longer than first flagellar segment; EL 0.80-0.86 x OMD. Posterior ocelli separated by about 3 x diameter of anterior ocellus, removed from eye margin by about 3.5 x diameter of anterior ocellus. Mandible with seven teeth.

Thorax robust, PW 0.65-0.66 x WL. In profile, posterior two-thirds of



mesoscutum slightly convex, more flattened caudad, posterior margin below anterior margin of scutellum; scutellum, in profile, broadly convex; metanotum not protruding.

Petiole, in profile, compressed, about twice as high as thick at level of spiracle, crest thin; in frontal view, deeply notched; from above about 3.5 x wider than thick.

Vestiture.—Cephalic pubescence yellowish, as long or longer than an ocellar diameter, much of it reclinate rather than appressed; scattered, not obscuring surface except on cheeks above mandibular insertions. Thoracic and gastric pubescence white, appressed to reclinate; long, not concealing surface, but quite dense on gaster. Scape hairs reclinate; cheeks with a few long erect hairs in frontal view; thoracic dorsum with numerous erect yellowish hairs, longest on scutellum; erect hairs on disc of first gastric tergite no longer than basal thickness of hind tibiae; petiolar scale with a few short erect hairs on crest; fore femora without erect hairs on inner face; middle and hind tibiae with abundant suberect hairs on outer face. Wings without marginal fringe, but membrane with abundant short, erect hairs.

Integument.—Head shiny, with coarse setigerous punctures on clypeus and upper half of cheeks; frons and occiput with fine well-separated piligerous punctures; frontal lobes with dense, fine, punctures. Pronotum finely and densely punctate; mesopleurae moderately shiny, densely coriaceous, with fine punctures peripherally and scattered coarse, setigerous punctures; metapleurae duller, densely tessellate, abundantly punctate, punctures finer than those in middle of mesopleura; mesoscutum densely, finely punctate, except for sparsely punctate area along midline, punctures laterad of parapsidal lines sparser than those of disc; mesocutellar punctures equal to those of mesoscutum, sparser in middle; metanotum dull, densely coriaceous and micropunctate; propodeum slightly shiny, roughened and densely coriaceous. Gaster moderately shiny, with fine, dense piligerous punctures.

Color.—Uniformly light brownish except for yellowish mandible, lateral clypeal lobes and lower half, or less, of genae. Wings hyaline, veins and stigma light brownish.

MALE. *Measurements*.—HL 0.63-0.71; HW 0.60-0.63; SL 0.70-0.73; EL 0.23-0.25; OMD 0.13-0.15; WL 1.53-1.66; PW 0.93-1.00.

In full face view, sides of head strongly convergent toward mandibular insertions, margins straight; head a little longer than broad, CI 90-94; slightly shorter than scape; SI 114-115; OMD 0.56-0.60 x EL; ocelli subequal to one

FIGURE 2. *Myrmecocystus creightoni*, new species. A, female, lateral view; Aa, female head, frontal view; Ab, female mesoscutum. B, worker major, lateral view; Ba, worker major, head, frontal view; Bb, worker minor, head, frontal view; Bc, worker petiole, profile and posterior views. C, male, lateral view; Ca, male head, frontal view; Cb, male mandible; Cc, male ninth sternite; Cd, male volsella, inner view, Ce, male aedeagus, lateral view.

another; IOD 3.5-4.0 x OD; OOD 2.5-3.0 x OD. Mandibular margin simple, with preapical notch and two small denticulae basad, apical tooth as broad at base as long. Clypeus usually without preapical transverse depression.

Petiolar scale in profile, higher than long, evenly thick from base to near summit where it is narrowly rounded to slightly angulate; crest, seen from front, angulate at sides, broadly and rather deeply emarginate; in dorsal view, about 2.25 x wider than long.

Terminalia: Fig. 2 Cc-e.

Vestiture.—White, appressed pubescence long, sparse on head and thoracic dorsum; more abundant on thoracic pleurae, particularly on propodeum; longest on gaster, but nowhere concealing surface. Erect hairs sparse, short on head and thorax, yellowish. Middle of first tergite, in profile, with abundant very short, suberect whitish hairs; tergites with scattered long to very long yellowish hairs, especially caudad and ventrally. Fore and hind wings fringed along apical and hind margins.

Integument.—Head shiny, with scattered fine punctures. Mesoscutum shiny with sparse fine punctures; propodeum, meso- and metapleurae duller, densely coriaceous, with scattered fine punctures; scutellum with a few very fine punctures. Gaster shiny, finely piligerously punctate.

Color.—Uniformly light to very dark brownish, appendages and mandibles lighter. Wings hyaline, veins and stigma light brownish.

Type material.—Holotype worker, allotype male, 18 ♀♀, 35 ♂♂, 305 ♀♀ paratypes. Pearblossom, 2 mi S, 3500 ft, Los Angeles Co., Calif., 12 February 1967 (R. R. Snelling). Additional paratypes: 1♀, 322 ♀♀, same locality, 20 March 1966 (R.R. Snelling). Holotype, allotype and most paratypes in LACM; nine paratypes in each of the following: AMNH, MCZ, MNHG, USNM and private collections of A. C. Cole, Jr., W. S. Creighton, and G. C. Wheeler.

Etymology.—It is my pleasure to dedicate this species to Professor W. S. Creighton for his outstanding contributions to the understanding of United States ants, with my thanks for his generosity and enthusiastic encouragement during this study.

Habitat.—The type series was taken in coarse, sandy soil above a dry wash on the edge of the Mojave Desert, in a mixed creosote bush-juniper-Joshua tree ecotone.

Additional samples are from Kern and Riverside Counties, in areas of mixed creosote bush and juniper. The known elevational amplitude is from 3000-4300 feet.

Discussion.—In Creighton's key (1950) this ant will key to *M. yuma* Wheeler. Creighton (1956) synonymized *M. yuma* under *M. lugubris*, but I believe that he was in error and recognize *M. yuma* as a valid species. The absence of conspicuous erect hairs on the antennal scapes and propodeum will readily separate workers of *M. creightoni* from *M. yuma* and *M. hammettensis*

Cole. Conspicuous erect hairs are present on the pronotum and mesonotum of *M. lugubris* but lacking in *M. creightoni*.

The female of *M. creightoni* has the mesoscutum finely and rather uniformly closely punctate except for a small area of sparser punctation medially; those of *M. yuma* and *M. hammettensis* have the mesoscutum almost impunctate between the parapsides with scattered coarse, setigerous punctures. The female of *M. lugubris* is unknown, but by analogy with other, underscribed species, should have a mesoscutum with mixed coarse and fine punctures and a broad, median impunctate area.

The males of *M. lugubris* and *M. hammettensis* lack fringe hairs on the wings, present in *M. creightoni*. The male of *M. yuma* is unknown, and I do not care to speculate on its characteristics, since those of its nearest relatives also are unknown.

Myrmecocystus wheeleri, new species

Figure 3

Myrmecocystus melliger semirufus var. *testaceus*, Wheeler, 1908. Bull. Amer. Mus. Nat. Hist. 24:355-356. (in part, misidentification)

Diagnosis.—Not closely related to any known species but most closely resembles *M. kennedyi* Cole (= *M. semirufus* of authors, not Emery, 1893). Workers are readily separated from all other species by the concolorous orange ferruginous head, thorax and gaster. From variant populations of *M. kennedyi* with partially concolorous gaster, *M. wheeleri* may be separated by the presence of abundant, close appressed white hairs on the third tergite. Males are most easily recognized by the shape of the aedeagus and unusually large teeth of that structure (Fig. 3 Ce).

WORKER. Measurements.—HL 0.93-1.26 (1.26); HW 0.83-1.10 (1.10); SL 1.16-1.60 (1.60); WL 1.6-2.0 (2.0); PW 0.60-0.83 (0.83).

Head a little longer than broad, CI = 81-96 (86), distinctly shorter than scape; SI = 130-153 (145). In frontal view, head broadest at, or a little below, the eyes, sides straight or slightly, evenly convex, narrowed slightly toward mandibular insertions. Occiput in frontal view broadly rounded laterally, summit slightly convex or flattened. Eye small, barely longer than first flagellar segment; removed from mandibular insertion by 1.5-2.1 (2.1) times its own length. Mandibles usually with seven, rarely eight, teeth.

Thorax slender, PW 0.36-0.43 (0.41) x WL. Basal face of propodeum broadly rounded into posterior face.

Petiole, in profile, about as thick as high, narrowed toward evenly rounded apex; crest evenly convex in frontal view; in dorsal view, scale 1.4-1.5 x wider than long.

Vestiture.—Erect hairs sparse on head, confined mainly to clypeus, frontal area and occiput, those of occiput distinctly longer than eye length, of frons and clypeus variable, but mostly shorter than eye length; cheeks with scattered

erect hairs less than half as long as eye length. Pronotum with 12-18 erect hairs of irregular length, all shorter than eye length, a variable number of much shorter hairs on neck; mesonotum with about a dozen erect hairs, less than half eye length long; metanotum usually without erect hairs; propodeum with 12 or more erect hairs of variable length, the longest equal to half, or a little more, maximum eye length. Petiolar scale with 6-10 fine, erect short hairs on crest. Discs of gastric segments with sparse erect hairs, about equal to half of maximum eye length, hairs of tergal margins only slightly shorter than eye length. Scapes with abundant fine, short suberect hairs on inner and lower faces. Inner face of fore femora without erect hairs except along lower margin, these about as long as those of outer face. Middle and hind tibiae with abundant fine, reclinate hairs on all surfaces, these a little shorter than minimum thickness of the tibiae. Appressed pubescence sparse, short, on head, denser on occiput and vertex; distinctly longer and denser on thorax, coxae and femora, petiole and first three gastric tergites. Pubescence very sparse or absent from fourth and fifth tergites.

Color.—Orange ferruginous, often with lower half of face more yellowish; fourth and fifth gastric segments often infusate. Rarely most of alitrunk, gaster and legs infusate in some minors.

FEMALE. Measurements.—HL 1.8; HW 1.8; SL 1.8; EL 0.4; OMD 0.7; WL 4.0; PW 2.5.

Head as broad as long, CI = 100, as long as scape; SI = 100. In frontal view, head parallel-sided, as broad at mandibular insertions as at lower eye level. Occiput rounded laterally, without evident corners, slightly convex in middle. Eye small, 1.3 times length of first funicular segment, removed from mandibular insertion by 1.6 times its length. Lateral ocelli separated by 2.5 times diameter of anterior ocellus, separated from eye margin by 3.5 times diameter of anterior ocellus. Penultimate segment of maxillary palpi broadest at basal third, strongly narrowed toward apex.

Thorax robust, PW 0.62 x WL. In profile, posterior half of mesoscutum flat, apical margin below level of convex scutellum; scutellum and metanotum forming continuous convex surface.

Petiole in profile compressed-cuneate, crest sharp; distinctly notched; from above, about three times wider than long.

Vestiture.—Erect hairs present on all parts of face, least abundant on cheeks immediately below eyes and between eyes and ocelli; occipital hairs irregular in length, longest about as long as eye length, hairs on frons and clypeus equally variable, but a little shorter. Hairs abundant on thoracic dorsum and sides highly variable in length, some longer than eye length (especially on sides); basal third of propodeum with abundant long hair, apical two-thirds with very short erect hairs, especially toward apex and around gland opening. Crest and sides of petiolar scale with numerous long erect hairs, gastric tergites with abundant fully erect hairs on disc, separated

by less than their own lengths, mostly about half as long as eye length. Fore femora without conspicuous erect hair on inner face. All tibiae with abundant suberect hairs which are about as long as minimum thickness of hind tibia. Scapes with abundant suberect, short hairs on outer and lower faces. Forewing without marginal fringe, hind wing fringed on posterior margin.

Pubescence long, notably dense only on first three gastric tergites, variably fully appressed to subappressed, especially on head.

Integument.—Head moderately shiny, surface micro-reticulate; frontal lobes with close, fine punctures of variable size, round to ovoid, separated by about a puncture diameter; genae more sparsely, coarsely punctate. Center of mesoscutum impunctate, median area laterally with scattered fine punctures, becoming closer and more distinct in lateral thirds and apically; anteriorly, median portion with sparse micropunctures; punctures denser and coarser laterad of parapsides. Punctures of scutellum finer than of adjacent portion of scutum, sparse in middle, denser laterad; mesopleura above minutely roughened between coarse, close punctures, below equally coarsely, more closely punctate; metapleura and propodeum similar to lower half of mesopleura.

Color.—Orange ferruginous, the following brownish: rectangular median mark on anterior half of mesoscutum, broad lateral stripes on posterior four-fifths of mesoscutum, irregular blotch on mesopleura above and irregular blotch on mesepisternum. Apical gastric segments lightly infuscated. Wings whitish hyaline, radial vein and stigma brownish, remainder of veins yellowish.

MALE. Measurements.—HL 0.86-0.90; HW 0.83-0.90; SL 1.03-1.10; EL 0.30-0.33; WL 2.0-2.2; PW 1.16-1.23.

Margins of head distinctly convergent toward mandibular insertions; head as broad as long or slightly longer (CI 96-100), distinctly shorter than scape; SI 119-128. OMD 0.80-0.90 x EL. Anterior ocellus $\frac{2}{3}$ diameter of lateral ocelli; IOD 2.5-3.0 x OD; OOD 2.5-3.0 x OD. Mandible without basal teeth. Clypeus with short transverse depression below middle.

Petiole, in profile, higher than long, narrowed above, crest convex; in frontal view, evenly convex from side to side, except for vague to prominent median notch; in dorsal view about twice as wide as long.

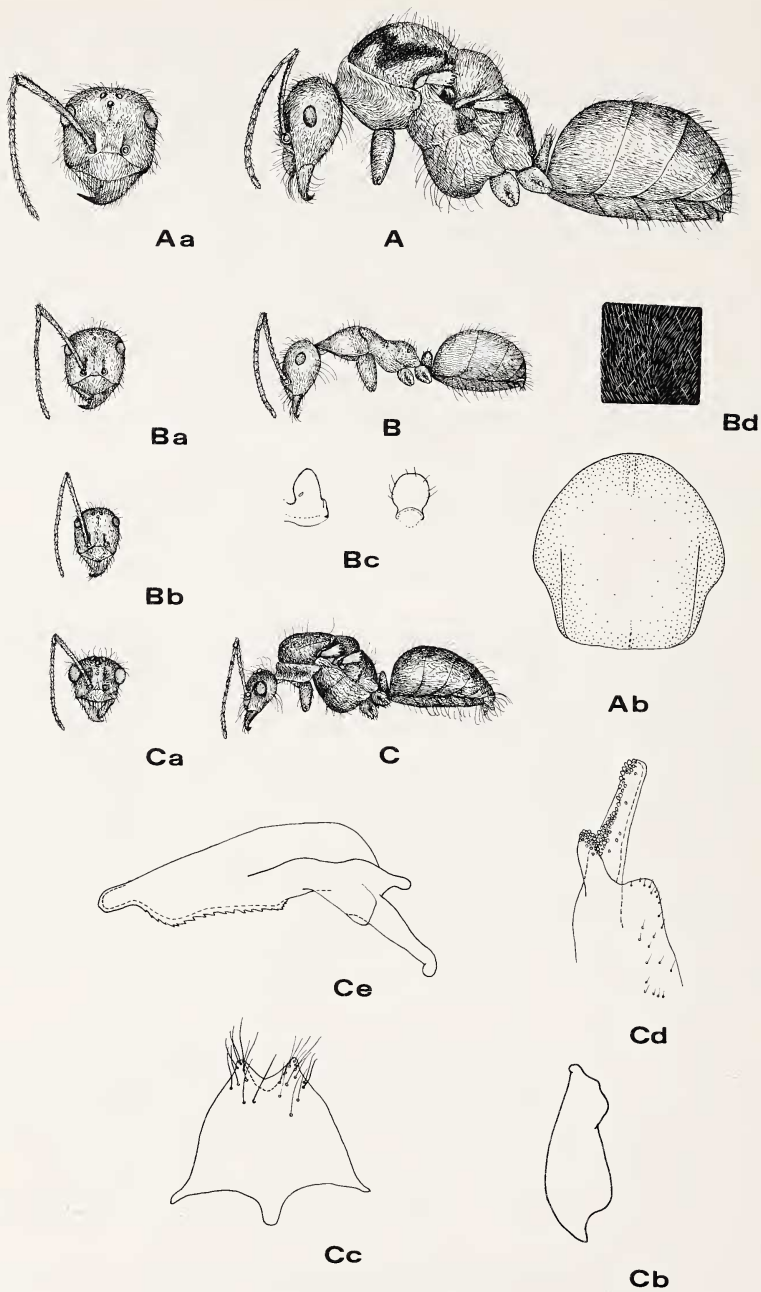
Terminalia: Fig. 3 Cc-e.

Vestiture.—Erect hairs abundant on body, those of scutellum as long as eye diameter, length elsewhere generally shorter but variable. Erect hairs of hind tibiae about as long as thickness of scape. Pubescence sparse on head and thorax, abundant on propodeum and first four tergites. Forewing without marginal fringe, hind wing with fringe on posterior margin only.

Integument.—Moderately shiny, closely coriaceous, with scattered fine piligerous punctures.

Color.—Uniformly blackish, appendages light brownish.

Type material.—Holotype worker, allotype male, 193 worker and two



female paratypes, 6 mi SE of Pearblossom, 3500 ft, Los Angeles Co., 15 August 1965 (R. R. Snelling). Holotype, allotype and most paratypes in LACM; six paratypes in each of the following: AMNH, MNHG, USNM and the collections of A. C. Cole, W. S. Creighton, and G. C. Wheeler.

Etymology.—This ant is dedicated to the late William Morton Wheeler, whose career included the first comprehensive study of these remarkable ants.

Habitat.—This species occurs from the central San Joaquin Valley (Merced County) southward to San Diego County, in habitats ranging from oak grasslands to juniper-piñon. The workers forage diurnally and frequent blossoms for nectar in addition to being assiduous scavenger-predators of other small insects. Repletes are unknown.

Discussion.—This species was erroneously identified by Wheeler (1908, 1912) as *M. melliger semirufus* var. *testaceus* Emery. Emery's species is unrelated and belongs to the *mexicanus* group, where it is a senior synonym of *M. mexicanus mojave* Wheeler (Snelling, 1969). The concolorous orange-ferruginous body of the worker caste is usually sufficient to separate *M. wheeleri* from all other species. Some samples of *M. kennedyi* Cole (= *M. melliger semirufus* of authors, not of Emery; see Snelling, 1969) may have the first two gastric segments orange-ferruginous. These may be separated from *M. wheeleri* by the lack of dense appressed hairs on the third tergite. Minor workers of some populations of *M. wheeleri* from Mojave desert areas of Los Angeles County have the entire gaster, legs and much of the thorax extensively infuscated. The media and large workers are normally colored. These minors may be separated from those of *M. kennedyi* and *M. flaviceps* Wheeler by the combination of densely pubescent third tergite and long, flexuous hairs on the pronotum.

The female is best recognized by the largely orange-ferruginous color and the shape of the penultimate segment of the maxillary palpi. The shape of the male aedeagus is unique and is the best recognition character for this caste.

FIGURE 3. *Myrmecocystus wheeleri*, new species. A, female, lateral view; Aa, female head, frontal view; Ab, female mesoscutum. B, worker major, lateral view; Ba, worker major, head, frontal view; Bb, worker minor, head, frontal view; Bc, worker petiole, profile and posterior views; Bd, worker, portion of third tergite to show distribution of erect and appressed vestiture. C, male, lateral view; Ca, male head, frontal view; Cb, male mandible; Cc, male ninth sternite; Cd, male volsella, inner view; Ce, male aedeagus, lateral view.

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